Space Weather Forecast

Issued on Tuesday, 03 October 2023 at 01:15 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Moderate-flares throughout. Slight chance of isolated G1/Minor Storm interval, mainly day 2 (04 Oct)

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Moderate with one Moderate flare occurring. This was from the area of 'plage' southeast of the small sunspot near the northeast limb. These plage areas are bright spots on the Sun, which can be caused by previously decayed sunspots, and can also be the source of a newly developing ones. No sunspot has yet emerged in this region, however there are nine sunspot regions on the visible disc. The region in the south-centre disc showed sign of decay, with reducing area, but maintained a slightly more complex magnetic structure. The two regions in the northeast continued to show a gradual spreading of spots and consolidation of their leader and trailer spots. The other main growth was in the north centre disc, where a small region saw the emergence of a distinct trailer spot, however this remained magnetically simple.

There were no Earth-directed CMEs observed

Solar Wind / Geomagnetic Activity: Solar wind speeds were at background, around 380-350 km/s. The interplanetary magnetic field (IMF), was weak throughout. The north-south component, was weak throughout, but initially mainly negative (southward), before becoming predominately positive (northward) from 02/1000 UTC. Geomagnetic activity was Quiet to Unsettled (Kp 1-3).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background levels, with no Solar Radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Low to Moderate with a chance of further isolated Moderate-class flares.

Solar Wind / Geomagnetic Activity: There are no Earth-directed CMEs. Solar winds are at background, with any significant connection to the coronal hole in the northwest now considered unlikely. By the end of day 1 (03 Oct) but more likely day 2 (04 Oct), a connection to the fast wind from a small equatorial coronal hole is expected. Any enhancement is likely to be weak, with winds likely increasing to 450-500km/s. Mainly Quiet geomagnetic activity expected with isolated Unsettled spells. Any fast wind arrival has the potential to bring a spell of Unsettled to Active, with a slight chance of G1 Minor Storm intervals, most likely day 2 (04 Oct).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to remain at Background levels, with no Solar Radiation storms expected.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	20	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	50	50	45	40
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	2	2	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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